IV. MANAGEMENT CONSIDERATIONS

AREAS OF CONTROVERSY

Several concerns about the Riley Ridge Project were raised during the public scoping meetings held in Cheyenne, Kemmerer, Pinedale, and Big Piney, Wyoming on November 2, 3, 4, and 5, 1981, respectively, and through the mail-in comments in July of 1982. The results of these comments were summarized in a document entitled Public Concerns and Scope of the EIS. The draft EIS was filed with the Environmental Protection Agency on May 20, 1983, and announced in the Federal Register on Thursday, May 26, 1983.

During the 60-day public comment period (May 20 to July 19, 1983), BLM and FS conducted four formal public hearings to solicit comments on the draft EIS. The BLM and FS also received 44 letters addressing the draft EIS during the public comment period. The most significant issues raised during the scoping and in the comments concerned socioeconomics, wildlife, air quality, and health and safety.

The socioeconomic effects to communities and the people within the study area from project activities (construction personnel, etc.) was identified as a significant issue and concern. The area has experienced boom-type growth in the past from energy development and is thus sensitive to any similar future developments.

The effects to wildlife and wildlife habitat (especially within the well field) are a major concern to the FS, BLM, Fish and Wildlife Service (FWS), Wyoming Department of Game and Fish, and the general public. Hunting is an important recreational activity in Wyoming. The well field lies in an area which is critical range (wintering areas, calving areas, etc.) for elk, deer, pronghorn (antelope), and moose. Development of all types has reduced the amount of winter range for big game. Feedgrounds have been utilized to compensate for lost habitat; however, the quantity and quality of big game herds has been affected. The well field area encompasses one of the last natural wintering areas in the Upper Green River Valley for elk.

Air quality, concerns were expressed by the BLM, FS, National Park Service, Environmental Protection Agency, and general public. The project area is located in a region of western Wyoming where air quality is good and relatively unaffected by industrial development. The major exception to this is in the trona mining area near Green River, Wyoming. Concerns were generally related to reductions in air quality in national parks and wilderness areas (Class I) and in the general project area (Class II) to reductions in visibility in national parks and wilderness

areas, and to the effects of acid deposition on air quality related values in the Bridger Wilderness to the east of the proposed gas treatment plants.

Effects to human health and safety from the release of hydrogen sulfide (H_2S) gas is an issue to the general public and the agencies. The natural gas, as taken from the wells, contains a small percentage of H_2S which is toxic. Potential areas where hazards from H_2S are possible are wells, pipelines, and at the plants. Final locations of sour gas pipelines must consider health and safety factors.

MAJOR IMPACT CONCLUSIONS

Western Wyoming is currently undergoing a change from an area characterized by rangeland and wilderness to one experiencing industrial growth and active exploration and development of oil and gas reserves and other energy and non-energy commodities. This trend is having many beneficial and adverse effects on the human and natural environments of the area. Positive impacts include increased employment and increased local revenue. Revenues directly related to resource extraction associated with the Riley Ridge Project are the state-levied ad valorem and severance taxes and a federally collected royalty. The revenue to Wyoming from the mineral severance tax alone was $138 million in 1981. The result of these revenues has been a substantial increase in the State's general fund and benefits to the entire state and local communities. The responses to Public Hearing comments provide further discussion concerning these revenues.

As with any project, uncertainties exist relative to the timing of project implementation and ultimate size. For the projects included in the Riley Ridge EIS, there is significant potential for delay in project implementation. Although these delays cannot be quantified at this time, it is very probable that several of the proposed plants and the field development in support of those plants could be delayed for a period of up to five years.

The Riley Ridge EIS Proposed Action is a "worst-case" or maximized development and implementation impacts analysis for all projects defined by the applicants in their individual right-of-way applications. If one or more of the proposed plants currently analyzed under the Proposed Action is delayed, the resulting impacts are anticipated to be less than those presented. Since the probable delays cannot be quantified at this time, the reduction of impacts also cannot be quantified.

The major unmitigated environmental impacts of the Riley Ridge Project are detailed in Chapter 4 of the Draft EIS (DEIS). A revised comparative analysis (Section 2) is contained in the final EIS (FEIS). Impacts associated with implementation of the Proposed Action and alternatives considering the committed mitigation measures are compared in this section. However, there are several major issues and impacts associated with the Proposed Action which need to be stressed. These are summarized below.

Socioeconomics

The construction of the Riley Ridge Project would create significant, potentially adverse impacts in the short-term and beneficial impacts in the long-term. The peak direct employment for nearly 3,000 workers would contribute to a strong regional economy in Lincoln, Sublette, and Sweetwater Counties, but place demands on local governments, particularly Sublette County, that would far exceed their current service capacity and fiscal capability. In the long term the revenues accruing to affected jurisdictions could provide substantial local benefits and opportunities for enhancing the quality of life. While these prospects are attractive, the short-term problems could create substantial hardships for newcomers and residents alike, due to crowding and service shortfalls.

Wildlife and Fisheries

Several aspects of the Riley Ridge Project would result in significant adverse impacts to wildlife within the study area. A serious impact would result from the increase in human population and accompanying human disturbance to wildlife in the form of increased hunting and fishing pressure. Increased game violations, harassment, and road kills would also result from the project. Another significant impact would be the disturbance of critical ranges during their season of use and a loss of critical ranges through project development activities.

The project presents the possibility of adversely affecting streams in the well field area. Increased long-term siltation coupled with increased fishing pressure, altered stream flows, and a few accidental spills could create sufficient stress on the existing fishery to significantly reduce its future value. Special concern is held for the native Colorado River cutthroat trout.

Health and Safety

The probability of a well blowout or a pipeline rupture is critical in determining the effects to humans from the presence of H_2S gas. Because the gas is extremely toxic, the frequency of an accident and dispersion of the gas is critical. Analysis for the project has indicated that there would be a potential for 2.3 well blowouts associated with drilling and production operation during the lifetime of this project. Individuals within one-half mile of a well blowout could be subjected to lethal levels of at least 1,000 parts/million H_2S, individuals within 1 to 2 miles could be subject to significant doses of H_2S; i.e., doses that would cause human discomfort.

Based on the pipeline rupture analysis, it was concluded that in any year there is about a 7 percent chance that ruptures would occur in the gathering system, but there is only about a 1 percent chance that a trunk line would rupture. The size of the ruptured pipeline would determine the potential impact on humans. The rupture of a 4-inch pipeline would

not result in lethal H_2S doses to people in towns or traveling established routes, while the rupture of a 12-inch pipeline or an 18 to 26-inch pipeline could cause lethal doses to individuals within 1 to 3 miles, respectively.

Based on modeling results with the implementation of mitigation measures, populated areas (such as Big Piney and LaBarge) and sensitive receptors (such as isolated ranches and industrial sites) in the study area would be at minimum (less than 3 in 100,000) risk of exposure to significant levels of H_2S from a trunk line rupture.

Water Resources

Impacts to water resources are difficult to assess because of data gaps relating to (1)characteristics of the surface and groundwater systems, (2)the frequency of events (leaks, ruptures, other failures) affecting water resources, and (3)engineering details on the applicant's waste water disposal systems. While quantification is not possible, significant impacts on water resources are expected to occur during the life of the project. In order to reduce potential impacts, mitigation measures have been developed but additional environmental analysis and monitoring will be required. The project will also have to comply with the permit requirements of the State of Wyoming.

Air Quality

While significant air quality impacts were predicted from the operation of the Riley Ridge Project, all companies would be required to comply with the Prevention of Significant Deterioration (PSD) Class II increment for sulfur dioxide (SO_2) and the Wyoming Ambient Air Quality Standard (WAAQS) for hydrogen sulfide (H_2S). There would be no exceedances of the PSD Class I standards. Significant odor impacts resulting from releases of small amounts of H_2S would occur near the East Dry Basin plant site but would not affect populated areas.

Soils and Vegetation

The Riley Ridge Project would disturb approximately 12,115 acres of soils and vegetation during construction and 3,620 acres during operation. 641 acres, or 5 percent, would remain in roads and railroads after abandonment. In assessing significant impacts, it has been assumed that the Erosion Control, Revegetation, and Restoration Guidelines (Attachment B.7) would be successfully implemented and that soils would be stabilized within 5 years following construction or abandonment. No signficant impacts to soils are anticipated. About 63 acres of riparian vegetation would be disturbed by well field access roads and the sulfur loadout during project operation, and this long-term disturbance is considered a significant impact.

Visual Resources

The project as proposed would substantially alter the visual character of much of the project area. It would contribute to a continued progression from a predominantly natural landscape to one that is man-dominated. Most affected would be the well field and lands crossed by the molten sulfur pipeline.

Cultural Resources

Construction and operation of the Riley Ridge Project would cause both direct and indirect impacts to cultural resources in the study area. A Class III (100 percent) survey of each area to be disturbed will be conducted prior to construction to determine the actual resources present and the potential impacts to those resources. Less than 5 percent of the study area has been previously surveyed.

Recreation

During the years when the construction workforce would be at its peak, the quality of recreation experiences available in the area would be significantly impacted. The long-term prospects, however, would be much more favorable and all affected groups, newcomers, long-time residents, and temporary visitors, would be able to enjoy the area's many recreation opportunities.

Wilderness

Both short-term and long-term significant impacts to wilderness-related values would occur to the following areas: Bridger Wilderness, Scab Creek Instant Study Area, Lake Mountain Wilderness Study Area, and high density use corridors of the Popo Agie Primitive Area and Teton Wilderness. Impacts would be primarily attributed to anticipated increases in visitation. The ability of the wilderness resources to absorb social, physical, and biological impacts would likely be exceeded. Wilderness related values could be significantly impaired by severely diminishing the quality of user experiences through increased visitation. Potential impacts of one air quality related value (AQRV), water quality related to acid deposition in high mountain lakes, has been determined to be significant.

Agriculture/Grazing

Impacts to agriculture and grazing would be generally insignificant. Significant impacts due to loss of forage, however, would occur in 5 small grazing allotments during construction. Unquantifiable but significant impacts could also occur to those ranchers using the Slate Creek sheep trail. There would be no impacts to prime farm land.

Timber

Impacts to timber would be generally favorable due to project construction of new access roads that would reduce the costs of timber harvesting in otherwise remote and previously inaccessible areas.

Transportation

In the summers of peak development, construction activities plus anticipated recreational travel would create traffic volumes that would lead to traffic congestion and traffic slowing in and around Kemmerer, Opal, LaBarge, Big Piney, and Marbleton during peak commuter hours. While these would not be so severe as to disrupt emergency services (police, fire, and ambulance) they could be annoying to the resident public and perceived as a degradation in the quality of life in the area. These impacts would only be temporary, however. Once construction is completed, traffic volumes due to the proposed project would decrease substantially.

Land Use

The principal land use conflicts of the proposed project are with the planning objectives of the federal land management agencies to locate linear facilities such as transmission lines and pipelines in common corridors. Except for conflicts with Sublette County zoning, which would probably be dealt with administratively for many areas affected by the project, existing land use plans encourage the type of development that is proposed.

Noise

Noise impacts would be localized but significant during construction due to heavy truck traffic. Residences and businesses within one-half mile of U.S. 189, U.S. 30, and S.R. 240 would be most affected.

DECISION RATIONALE

Having congnizance of the above concerns the following management considerations were key in the decision to authorize the selected Riley Ridge Natural Gas Project right-of-way permits and leases.

Well Field

Leaseholders must be given their legal right to develop their various leases. Thus, the Federal Government (BLM and FS) is obliged to approve or disapprove APD actions for the active federal gas leases.

The Secretary of the Interior does not have the power to totally deny APDs strictly on environmental grounds. Site-specific APDs, however, can be denied on environmental grounds, but drilling must be allowed at some reasonable location on the lease, with reasonable mitigation measures.

To insure that the purpose and intent of NEPA is met and complied with in well field development, the BLM and FS, in conjunction with the preparation of the EIS, also developed a "Well Field Sensitivity Analysis System" technical report. The objective of the sensitivity analysis system is to: (1) identify sensitive and critical resources in the field; (2) identify potential conflicts; (3) develop solutions and mitigation measures to aid agencies in processing APDs; and (4) to provide a system that can be used for the management and monitoring of the well field throughout its life.

The BLM and FS are committed to ensuring that APD authorizations are based upon and supported by the Riley Ridge Natural Gas Project EIS, the Well Field Sensitivity Analysis System and that they comply with all standard procedures and requirements to mitigate potential impacts. In furtherance of this commitment, the BLM and FS have developed the APD Environmental Reference Report and Decision Record procedure described in Attachment D.

Treatment Plants

1. Management considerations paramount in the selection of the treatment plant locations were as follows:

   a. Socioeconomics

   Because Lincoln County is stronger in terms of fiscal condition than Sublette County, it would be better prepared to deal with the growth that would be associated with project development.

   The alternative was approved because of the overwhelming support by county (Lincoln, Sweetwater, and Sublette) and local (Kemmerer, Diamondville, LaBarge, Big Piney, Pinedale, and Rock Springs) governments, and the general public. They support this alternative because it would locate the treatment plants between Lincoln and Sublette Counties to provide the most balanced distribution of growth.

   b. Wildlife and Fisheries

   Increased human population and its related impacts, (e.g. legal and illegal hunting and fishing, wildlife harassment, road kills, and unintentional disturbance, etc.), would be less with the modified Shute Creek Alternative. This alternative allows a more even distribution of increased population within the study area. It would however, result in increased impacts to deer and antelope critical winter range at East Dry Basin. This tradeoff is preferred when compared to having a sour gas pipeline, sulfur pipeline, and power transmission line crossing the Green River. This would significantly affect fisheries in the event of a rupture, and waterfowl, eagles, whooping crane, etc., through collision with the powerline.

Because the East Dry Basin Plant location would permanently (30-50 years) eliminate 640 acres of critical deer and antelope winter range, Quasar would be required to investigate and evaluate the potential for mitigating the loss of critical winter range. This will be conducted in cooperation with the Wyoming Game and Fish and the BLM. All reasonable methods of mitigation shall be summarized in a mitigation plan, which will include a description of the methods, implementation, and monitoring, and shall be included as part of Quasar's Construction and Use (CU) Plan for the treatment plant for approval by the Authorized Officer.

c. Air Quality

Combined SO_2 impacts would be the least for this alternative. Odor impacts would be next to the lowest. Some residences may experience odor-causing levels (6.5 to 10 parts/million) of H_2S within a 4-mile radius of the East Dry Basin plant. The Buckhorn plant site is the only alternative site to offer less impact from odor. However, if a market for CO_2 is found, no odor problem should exist (90 percent of the odor problem is due to the venting of CO_2 which contains approximately 10 parts/million H_2S).

d. Recreation

Through the more even distribution of human population growth, recreation use patterns would create less impact.

e. Health and Safety

Since potential release of H_2S is proportional to the length of the sour gas trunk lines, this alternative would pose the highest potential impact. However, by applying the mitigation specified in Mitigation Measure H-4 the risk of H_2S exposure is comparable to those of the other alternatives.

f. Soils

Due to the highly critical watershed problem that exists in the area between the Green River and the Buckhorn plant site, the East Dry Basin plant site is preferred. Construction of a sour gas trunk line, sulfur pipeline, power transmission line, and access road to the Buckhorn site would cause increased erosion and sedimentation into the Green River, as well as intensify the problem of plugging the existing irrigation canal and spreading alluvial material over hay and pasture land. These disturbances would be avoided by locating the treatment plant at East Dry Basin.

2. East Dry Basin approval would be subject to satisfying the following concerns prior to granting:

a. Since American Quasar has announced that there will be an indefinite delay in their project plans, cumulative impacts associated with the Riley Ridge Project and other project developments must be reevaluated prior to granting. This is required to determine if the federal actions requested by Quasar are still within the parameters considered in the EIS.

b. In three to five years the transportation situation may completely change. Plant sites, sulfur loadout terminals, etc., not feasible today may be entirely so in a few years.

c. Because of the environmental concerns associated with the East Dry Basin, West Dry Basin and Buckhorn area in general, a need to reevaluate each location to determine if the East Dry Basin site is the most suitable has been recommended. The identified environmental concerns are as follows:

- o East Dry Basin provides critical deer and antelope winter range.
- o A plant at East Dry Basin would cause some residences to experience odor-causing levels (6.5 to 10 parts/million) of H_2S within a 4-mile radius of the plant.
- o A plant at Buckhorn would require crossing the Green River with a sour gas pipeline, molton sulfur pipeline and power transmission line potentially affecting fisheries, waterfowl, eagles, whooping crane, etc.
- o Buckhorn site access would cause the disturbance of highly erodible soils between the Green River and the plant site which would accelerate the siltation of irrigation ditches, adjacent hay fields and the Green River.
- o West Dry Basin is not classified as critical winter range.
- o The West Dry Basin site is 7-miles west of East Dry Basin site and thus should not subject residences to odor causing levels of H_2S.
- o Placing the proposed Quasar plant (1.2 billion cfd production capacity) at West Dry Basin would violate air quality standards. A reduction in plant production capacity could meet air quality standards.

Trunk Lines

Sour gas trunk line siting is largely a function of the well field gathering system terminus and the treatment plant locations. With these two points determined trunk line routing and alignment is concerned with (1) health and safety and (2) selecting an alignment that will cause the least environmental impact.

1. Health and Safety

Health and safety considerations are related primarily to public and worker exposure to hydrogen sulfide gas (H_2S) in excess of acceptable levels.

Health and safety impacts from H_2S releases would be considered significant if exposure is likely to impair the sense of smell, irritate the eyes, or affect respiration. Exposure to 100 parts/million H_2S for 15 minutes is likely to cause these levels of discomfort, but is generally recognized to be a sublethal dose. Exposure to 250-500 parts/million H_2S for two minutes or less may also cause similar degrees of olfactory, visual, or respiratory distress, and may also be lethal to unusually sensitive individuals.

Of greater concern, one which goes well beyond the question of Health and Safety 'significance' is the possibility of lethal doses. Exposure to 1,000 parts/million of H_2S, even for an instant, is generally taken to be a lethal dosage unless immediate measures are taken to revive the victim.

Therefore, persons located beyond the extent of the 500 parts/million, instantaneous concentration or the 100 parts/million, 15-minute average concentration (whichever is farther) are considered to be outside the region of significant impacts. Nothwithstanding numerous safety measures for the pipeline system, it is nevertheless possible that a pipeline rupture may occur. Historical data on sour gas lines in Alberta, Canada, and on sweet gas lines in the United States support a rupture probability estimate of 0.0002 ruptures per pipeline mile-year (or one rupture per 5,000 mile-years). Historical data also suggest that ruptures occur more frequently in smaller pipes and in older pipes.

These probabilities show that there is a greater likelihood of a rupture in the gathering system than in the trunk lines, because there are more miles of pipeline in the gathering system. In any year there is about a 7 percent chance that one or more ruptures would occur in the gathering system, but there is only about a 1 percent chance that a trunk line would rupture. However, the possibility of a trunk line rupture is the more important concern, for the following reasons.

There are numerous differences between gathering pipeline systems and trunk lines. Gathering pipeline systems would generally be located in sparsely populated areas whereas trunk lines would pass closer to local communities. Gathering systems would generally be constructed of smaller diameter pipes, and the block valve spacing for gathering lines is usually less than for trunk lines. Therefore, if a rupture were to occur,the mass of gas released would be less from a gathering pipeline than from a trunk line.

Health and safety impacts would be mitigated by revised mitigation measure H-4. This measure requires that no sour gas trunk line be located closer than 1 mile to populated areas or sensitive receptors. The measure will reduce the probability of significant H_2S exposure to less than 3 in 100,000. It will require the location of the trunk lines away from sensitive areas.

Due to the distance restriction on sour gas pipeline location to receptors, alignment of two 24 to 30 inch pipelines across LaBarge Creek in the vicinity of the applicants' proposal will not be possible without (1) consumating a receptor (residence) purchase agreement for the two residences in the NE 1/4 NE 1/4, section 22, T. 26 N., R. 113 W.; and obtaining a variance for the receptor in NW 1/4 SE 1/4, section 14, T. 26 N., R. 113 W., and the receptor in NE 1/4 NE 1/4, section 26, T. 26 N., R. 113 W.; or (2) consumating a purchase agreement for the receptor in the SW 1/4 SW 1/4, section 22, T. 26 N., R. 113 W., and variances for the receptors in each the NE 1/4 NE 1/4, section 22, and the NW 1/4 SE 1/4, section 28, T. 26 N., R. 113 W.

If neither of the above two options can be satisfied, there is only one pipeline routing option left, which is along the east toe of the Hogsback crossing LaBarge Creek at the narrows in sections 19 and 30, of T. 26 N., R. 113 W. One variance would have to be obtained in accordance with Health and Safety Measure H-4, for the receptor in NW 1/4 SW 1/4, section 21, T. 26 N., R. 113 W.

2. Sour Gas Pipeline Alignment

Selecting an alignment that will cause the least environmental impact includes application of the required federal and applicant mitigation measures, the erosion control, revegetation and restoration guidelines, and the committed federal measures, developed through the EIS process (see Attachment B).

Pipeline location will, wherever feasible and reasonable, (1) utilize existing corridors; (2) minimize visual intrusion; (3) avoid historic trails; and (4) apply required measures to minimize increased sedimentation at all stream crossings.

Sales Gas Pipelines

Rationale is as presented in Section II, Sales Gas Pipelines.

Carbon Dioxide (CO_2) Gas Pipelines

Rationale is as presented in Section II, CO_2 Gas Pipelines.

Sulfur Transport and Loadout Facility

The Agency decision for transporting sulfur produced at the East Dry Basin plant is by molten sulfur pipeline. The reason for selecting this method over a railroad spur was essentially due to length. The sulfur pipeline would be approximately 54 miles long while the railroad spur would be approximately 92 miles long. Because of the additional length, the rail spur would disturb additional riparian vegetation and sensitive rehabilitation units. Because of its two crossings of the Green River the rail spur would cause increased temporary sedimentation of the river and stream crossings. The acreage permanently removed from production by the rail spur is 279 acres, or a 174 acre increase over the sulfur pipeline.

The molten sulfur pipeline would cause an increase in the miles of significant and highly significant visual impact, specifically 11.5 and 14.25 respectively versus 2 and 4 respectively for the rail spur. In addition, because the proposed location would parallel the Sublette Cutoff Emigrant Trail, public concern was raised and a relocation recommended. Also, because the location of 4 of the 5 sulfur drains are situated in major drainage bottoms (Sheep Creek, Fontenelle Creek, Muddy Creek, and LaBarge Creek) the need for further site specific analysis was indicated.

It is for the above reasons, coupled with the fact that no other alternative sulfur pipeline routings were analyzed, and questionable current technology for constructing a "workable" 54 mile long molten sulfur pipeline, that the Agency Decision is to withhold action until additional analysis is completed. Final action on the sulfur loadout facility would be handled at the same time.

Power Transmission Lines

The Agency Decision is to approve the applicant's proposed power transmission route over the UP&L and BLM routes. The reason for this is that the UP&L and BLM system would disturb significantly more acres of sensitive rehabilitation units than the Applicant's system. The UP&L system would also disturb up to 58 percent more cultural sites than the Applicant's system.

Treatment Plant Water Requirements

No significant impacts were identified with the water pipeline from the Green River to Northwest's treatment plant. Water purchase will be from the State of Wyoming and the intake structure will have to comply with State standards.

Employee Housing

The DEIS Agency Preferred Alternative specified that all applicants would be required to provide contruction camps for housing at all plant site locations. The basis for this is that:

1. Construction camps for employees and contractor housing would reduce impacts on housing.

2. Construction camps would reduce the amount of traffic on area roadways and thus the incidence of traffic accidents.

3. Construction camps would reduce the housing glut when construction terminates.

In consideration of public comments received encouraging the placement of construction camps within close proximity to towns, the Agency Decision is to require the applicants to provide costruction camps. However, the placement of them (at the plant site or close proximity to towns) will be at the applicants discretion.

Gravel, Riprap, and Fill Materials

An estimated total of 1,735,110 cubic yards of gravel and riprap will be required for well field development, plant construction and road construction. This material would be obtained from the ROW, commercial sources, or lands adjacent or near the ROW. Sources on public lands may be subject to further environmental anaysis at the time they are identified.